NON-PUBLIC?: N
ACCESSION #: 9208110365
LICENSEE EVENT REPORT (LER)

FACILITY NAME: St. Lucie Unit 2 PAGE: 1 OF 3

DOCKET NUMBER: 05000389

TITLE: Manual reactor trip due to low (A) Steam Generator Water level caused by a failed circuit in the 2A Feedwater Regulating valve control system
EVENT DATE: 07/08/92 LER #: 92-004-00 REPORT DATE: 08/07/92

OTHER FACILITIES INVOLVED: N/A DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Scott W. Sienkiewicz, Shift TELEPHONE: (407) 465-3550
Technical Advisor

COMPONENT FAILURE DESCRIPTION:
CAUSE: X SYSTEM: JB COMPONENT: CAP MANUFACTURER: R335
REPORTABLE NPRDS: Y

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On July 8, 1992 at 1134 hours with St. Lucie Unit 2 in mode 1 at 100% power, the reactor was manually tripped due to low (A) Steam Generator water level. Standard Post Trip Actions were performed as per EOP-1. Normal Steam Generator water levels were regained, two sets of safety function status checks were performed as per EOP-2 Reactor Trip Recovery and the plant was stabilized in Mode 3, Hot Standby.

The root cause of the reactor trip was a failed Lead/Lag circuit in the 2A Feedwater Regulating valve control system, which initiated the level transient of the 2A Steam Generator. The purpose of the Lead/Lag circuit is to provide fast initial valve response to a Steam Generator water level step change.

Corrective Actions for this event: 1) The Lead/Lag circuitry for the 2A Steam Generator Feedwater Regulating Valve Control System was removed from service after an engineering evaluation identified that the Lead/Lag circuitry had a negligible composition effect. 2) A final design charge by FP&L Engineering will address a possible permanent deletion of the Lead/Lag circuits from the Steam Generator water level control circuitry or a new replacement for both Units 1 and 2, 3) A review of other single point vulnerabilities related to this type of component failure in the Feedwater and Condensate systems will be performed by Technical Staff and I&C Maintenance. 4) Extensive simulator training was previously performed utilizing a Loss of Main Feedwater scenario. However, the Training Department will evaluate this specific event for inclusion into the Licensed Operator requalification program.

END OF ABSTRACT

DESCRIPTION OF THE EVENT

On July 8, 1992 at 1134 hours with St. Lucie Unit 2 in mode 1 at 100% power, the reactor was manually tripped due to low "A" Steam Generator(S/G)water level. Prior to the manual trip, the control room Operators received an "A" Steam Generator high level alarm and observed S/G water level rising rapidly. The "A" Feedwater regulating valve controller (EIIS:JB) appeared to have failed with zero indicated level input and controller output signals. When the Steam Generator water level reached the high level setpoint the Feedwater regulating valve automatically closed. The Steam Generator water level then began rapidly decreasing. When Steam Generator water level approached the automatic low level trip setpoint the reactor was tripped. Standard Post Trip Actions were performed as per EOP-1. Normal Steam Generator water levels were regained, two sets of safety function status checks were performed as per EOP-2 Reactor Trip Recovery and the plant was stabilized in Mode 3, Hot Standby.

CAUSE OF THE EVENT

Troubleshooting of the 2A Feedwater Regulating Valve Control System by I&C personnel showed that the Steam Generator water level Lead/Lag circuit output current was low and not responsive to the applied input current. Inspection of the circuit revealed that one of the three power supply filter capacitors was distorted. The circuit board appeared to be described in the area of the power supply due to heating. Bench testing indicated the power supply output voltages were incorrect and several voltage dropping resistors were hot indicating excessive current draw.

No other discrepancies were noted. The root cause of the event appears to be an aging related failure of the power supply filter capacitor.

ANALYSIS OF EVENT

This event is reportable under 10CFR50.73.a.2.iv as "any event or condition that resulted in manual or automatic actuation of any engineered safety feature, including the reactor protection system." The Assistant Nuclear Plant Supervisor directed Licensed Operators to manually trip the reactor in anticipation of an automatic RPS actuation, with the "A" Steam Generator water level at 30% narrow range and rapidly decreasing.

The plant response to this event was bounded by the accident analysis of the St. Lucie Unit 2 FUSAR, section 15.2, "Decreased Heat Removal by the Secondary System". The actual plant response was much more conservative because of the following:
1) Only one Feedwater Regulating Valve closed in this event, instead of the total loss of normal feedwater.
2) The reactor was manually tripped due to low 2A Steam Generator water level in the accident analysis, the reactor is assumed to trip on high pressurizer pressure.
The purpose of the Lead/Lag circuit is to provide fast initial valve response to a Steam Generator water level step change. All plant safety functions were met and there were no additional complications. The Auxiliary Feedwater Actuation System and the Steam Bypass Control System functioned as required during this event. The plant response during the reactor trip was observed to be normal for the given conditions. Consequently, the health and safety of the public were not affected by this event.

CORRECTIVE ACTIONS

1) The Lead/Lag circuitry for the 2A Steam Generator Feedwater Regulating Valve Control System was removed from service after an engineering evaluation identified that the Lead/Lag circuitry had a negligible compensation effect.

2) A final design change by FP&L Engineering will address a possible permanent deletion of the Lead/Lag circuits from the Steam Generator water level control circuitry or a new replacement for both Units 1 and 2 before their next refueling outage.

3) A review of other single point vulnerabilities related to this type

of component failure in the Feedwater and Condensate systems will be performed by Technical Staff and I&C Maintenance.

4) Extensive simulator training was previously performed utilizing a Loss of Main Feedwater scenario. However, the Training Department will evaluate this specific event for inclusion into the Licensed Operator requalification program.

ADDITIONAL INFORMATION

Failed Component Identification

The Lead/Lag circuit (Rochester, model # XSC-306-77698) in the 2A Feedwater Regulating valve control system.

Previous Similar Events

LER# DESCRIPTION

1) 335-88-03-00 Reactor trip on low Steam Generator level due to Main Feed Regulating valve equipment failure.

2) 335-88-08-00 Reactor trip on low Steam Generator water level due to inadvertent closure of a Main Feedwater valve.

ATTACHMENT 1 TO 9208110365 PAGE 1 OF 1

P.O. Box 128, Ft. Pierce, FL 34954-0128

August 7, 1992

FPL

L-92-209
10CFR 50.73

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

Re: St. Lucie Unit 2
Docket No. 50-389
Reportable Event: 92-004
Date of Event: July 8, 1992
Manual Reactor Trip due to

Low "A" Steam Generator Level

The attached Licensee Event Report is being submitted pursuant to the requirements of 10 CFR 50.73 to provide notification of the subject event.

Very truly yours,

D. A. Sager
Vice President
St. Lucie Plant

DAS/JWH/kw

Attachment

cc: Stewart D. Ebneter, Regional Administrator, USNRC Region II
Senior Resident Inspector, USNRC, St. Lucie Plant

DAS/PSL #737-92

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